

Appl. No. 10/567,794  
Appeal Brief

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re the application of:	)	
	)	Before the Examiner
Ernest De Ruiter	)	
	)	Joseph Micali
Serial No. 10/567,794	)	
	)	Art Unit 4181
Filing Date: February 9, 2006	)	
	)	Attorney Docket No. 78-10367
<b>ACTIVATED CHARCOAL</b>	)	
<b>PRODUCTION</b>	)	Date: July 31, 2009

MAIL STOP Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**APPELLANT'S BRIEF**

Sir:

This brief follows the Notice of Appeal filed June 3, 2009, in the above-captioned case and supports an appeal of the Examiner's rejection of claims in the Office Action dated May 8, 2009.

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**I. Real Parties in Interest**

The real parties in interest are the Assignees: Blucher GmbH and Schunk Kohlenstofftechnik GmbH

## **II. Related Appeals and Interferences**

Appellant and Appellant's legal representative know of no other prior or pending appeals, interferences or judicial proceedings that may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**III. Status of Claims**

Pending: Claims 18-37

Canceled: 1-17

Allowed: None

Rejected: Claims 18-37

Appealed: Claims 18-37

#### **IV. Status of Amendments**

A preliminary amendment was submitted on March 4, 2008, cancelling claims 1-17 and adding new claims 18-37. A response to the first Office Action issued on October 15, 2008, was submitted on January 14, 2009, amending claims 18, 36 and 37. All amendments made were entered by the Examiner. No further amendments have been submitted.

## **V. Summary of Claimed Subject Matter**

The following explanation of the subject matter defined in each of the independent claims at issue in this appeal is provided with reference to page and line numbers in the specification and to reference characters in the drawings in compliance with 37 C.F.R. §41.37(c)(v). These references are made to exemplary embodiments disclosed in the application in an effort to enable the Board to more quickly determine where the claimed subject matter is described in the application, and do not limit the scope of the claims.

### **A. Independent Claim 1**

The subject matter defined in independent claim 18 relates to a process for producing granular activated carbon by the carbonization of suitable carbonaceous polymers having the form of polymer granules. The polymer granules are continuously moved through a carbonization apparatus having a plurality of temperature zones to effect complete conversion of the starting material. The carbonization apparatus comprises the following temperature zones in the order presented: (a) a first temperature or sulfonating zone where groups capable of leading to free radicals and crosslinking upon thermal decomposition are introduced into starting materials lacking such groups; (b) a second temperature or precarbonization zone having a higher average temperature than the first zone where groups capable of thermally decomposing to provide free radicals (accompanied with the evolution of acid gases) and cross-linking are decomposed resulting in carbonization of the starting material accompanied by crosslinking of the polymers to form carbon; and (c) a third temperature or post-carbonization zone having a higher average temperature than the second zone where further carbonization is effected to provide complete conversion to carbon (page 12, line 27 through page 14, line 32). Throughout the process, the individual temperature zones are separately and independently controlled (page 16, lines 23-27).

### **B. Independent Claim 36**

The subject matter defined in independent claim 36 relates to the process of claim 18, further requiring the carbonization apparatus to have at least one lock between individual successive temperature zones or within the individual temperature zones so that there is at least essentially no mixing of process gases from different temperature zones separated by the at least one lock (page 15, line 28 through page 16, line 2).

### **C. Independent Claim 37**

The subject matter defined in independent claim 37 relates to the process of claim 18, further requiring the carbonization apparatus to have at least one lock between the second and third temperature zones so that acidic process gases from the second temperature zone are not mixed with the other process gases (page 15, line 28 through page 16, line 2).

**VI. Grounds of Rejection to be Reviewed on Appeal**

**A. Claims 18-19, 21, 25, and 27-35**

Claims 18-19, 21, 25, and 27-35 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Von Blucher (US Patent Pub. No. 2003/0092560) in view of Angelo II (US 4,273,619).

**B. Claims 22-24 and 36-37**

Claims 22-24 and 36-37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Von Blucher (US Patent Pub. No. 2003/0092560) in view of Angelo II (US 4,273,619) and further in view of Schwartz, Jr. (US 5,212,144).

**C. Claim 20**

Claim 20 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Von Blucher (US Patent Pub. No. 2003/0092560) in view of Angelo II (US 4,273,619) and further in view of Digre (US 5,437,237).

**D. Claim 26**

Claim 26 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Von Blucher (US Patent Pub. No. 2003/0092560) in view of Angelo II (US 4,273,619) and further in view of Giebelhausen et al. (US 6,316,378).

## **VII. Argument**

### **A. Rejection of Claim 18 and Dependent claims 19, 21, 25, and 27-35 under 35 U.S.C.**

#### **§103(a).**

Claims 18, 19, 21, 25, and 27-35 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Von Blucher (US Patent Pub. No. 2003/0092560) in view of Angelo II (US 4,273,619).

#### **1. Independent Claim 18 and dependent claims 19, 21, 25, and 27-35 are patentable**

##### **in view of 35 U.S.C. §103(c)**

Appellant respectfully submits that combination of references cited, primarily depending on the Von Blucher reference (US Patent Pub. No. 2003/0092560), fail to support a prima facie case of obviousness under 35 U.S.C. §103(a) because the present application (10/567,794) and the Von Blucher application (US Patent No. 2003/0092560, now US Patent No. 7,288,504 were at the time the invention of the present application was made, owned by Blucher GmbH, and thus the Von Blucher reference is not properly prior art under the exception codified by 35 U.S.C. §103(c).

#### **2. Independent Claim 18 and dependent claims 19, 21, 25, and 27-35 are patentable**

##### **in view of MPEP 2145 and the Cases cited therein.**

Appellant submits that the Von Blucher et al. and Angello II references cannot be combined because the Blucher et al. is not prior art under the exception codified by 35 U.S.C. §103(c). Moreover, even if the Von Blucher et al. reference were a proper prior art reference, the reference specifically teaches away from the combination. The combination can only be even suggested by picking and choosing from the art cited and ignoring the totality of the prior art. The reasons for this conclusion are provided in detail below.

According to MPEP 2145

#### **References Cannot Be Combined Where Reference Teaches Away from Their Combination**

It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983) (The claimed catalyst which contained both iron and an alkali metal was not suggested by the combination of a reference which taught the interchangeability of antimony and alkali metal with the same beneficial result, combined with a reference expressly excluding antimony from, and adding iron to, a catalyst.).

### **Proceeding Contrary to Accepted Wisdom Is Evidence of Nonobviousness**

The totality of the prior art must be considered, and proceeding contrary to accepted wisdom in the art is evidence of nonobviousness. *In re Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986) (Applicant's claimed process for sulfonating diphenyl sulfone at a temperature above 127°C was contrary to accepted wisdom because the prior art as a whole suggested using lower temperatures for optimum results as evidenced by charring, decomposition, or reduced yields at higher temperatures.).

Furthermore, "[k]nown disadvantages in old devices which would naturally discourage search for new inventions may be taken into account in determining obviousness." *United States v. Adams*, 383 U.S. 39, 52, 148 USPQ 479, 484 (1966).

Appellant submits that Von Blucher et al. specifically teaches away from the proposed combination of Von Blucher et al. and Angello II and that the proposed combination can only be arrived at through hindsight and by ignoring the totality of the prior art teaching. As a result, a prima facie case of obviousness has not been established with regard to claim 18.

Claim 18 relates to a method which requires, in part, that polymer granules be "...continuously moved through a carbonization apparatus comprising a plurality of temperature zones...wherein the carbonization apparatus comprises at least the following temperature zones in the following order: a) a first temperature zone ('sulfonating zone')... b) a second temperature zone ('precarbonization zone' or 'zone of acidic gases')...having a higher average temperature than the first temperature zone...; and then c) a third temperature zone ('post-carbonization zone')...having a higher average temperature than the second temperature zone...; wherein the individual temperature zones are separately and independently controlled." According to Appellant's claimed process, the steps of (a) sulfonation (zone 1), (b) decomposition leading to the cross-linking and the evolution of SO<sub>2</sub> (zone 2), and (c) post-carbonization (zone 3) are carried out continuously in the carbonization apparatus.

Such a process is specifically contrary to the teaching of Von Blucher et al. Von Blucher et al. teaches a discontinuous process involving a first step of sulfonation (when needed) and decomposition leading to cross-linking and the evolution of SO<sub>2</sub> (the acid phase) in a first apparatus followed by a second step involving post-carbonization in a second apparatus. According to Von Blucher et al., "The advantages of separating the acidic phase (precarbonization) from the high-temperature phase (activation) are numerous:" (see paragraph 0047 of Von Blucher et al.). Von Blucher et al. proceeds in paragraphs 0048 through 0051 to outline four of the advantages of his discontinuous process. The outlined advantages include: (1) the ability to disconnect the fast precarbonization step from the much slower carbonization/activation step and thus avoid the need to construct enormously long reactors constructed from acid proof materials; (2) by producing SO<sub>2</sub> in a continuous manner, SO<sub>2</sub> peaks can be avoided, allowing the washing devices to be much smaller; (3) the continuous, rather than sporadic output of SO<sub>2</sub> allows for its catalytic oxidation to SO<sub>3</sub> and further conversion into

sulphuric acid; and (4) the discontinuous process allows for the conversion of waste ion exchange materials into useful products. Finally, at paragraph 0048, Von Blucher further states that the "...long duration in the large rotary tube for the activation is also the reason why it is not operated in a continuously working basis because the required length thereof would be enormous." According to Von Blucher et al. the general process described in Appellants claim 18 should be carried out as two separate processes in two separate reactors, rather than as a single continuous process.

Appellant's claimed process is also unrelated to the process taught in Angello II. Angello II "...relates to new and useful improvements in apparatus for carbonizing such carbonaceous material as wood, coal, agricultural or industrial wastes, and in general any type of animal or vegetable material, to a charcoal form, and subsequently to activate the charcoal by further removal of the heavier volatile components thereof still retained therein." (first paragraph). Although the thrust of Angello II is the apparatus, a process is taught which can be carried out in the new apparatus. In this direct-fired process Angello II adds raw particulates, fuel and air to zone A (Appellant's zone 1) of the apparatus, and initiates combustion in that region creating a "fireball" (column 6, line 12) above the particulates. The combustion initiated becomes self-sustaining and provides heat to drive off volatiles and initiate carbonization. Angello II's first step in zone A (Appellant's zone 1) involves the removal of volatiles from the particulates in the proximity of a fireball designed to generate as much heat as possible. Unlike Appellant's process where each successive zone is maintained at a higher temperature, and the first two zones are devoted to functionalization and cross-linking at lower temperatures, Angello II is not concerned with controlling the temperature in zone A (Appellant's zone 1) or with the chemistry occurring there. Instead Angello II is only concerned with removing volatiles from the raw particulates as quickly as possible by adding as much heat as possible proximate the particulates in zone A. Unwanted combustion of the particulates is controlled by limiting the available oxygen. Unlike the final and hottest zone (zone 3) utilized in Appellant's claimed process, the final zone (zone D) in Angello II's process is cooler than the previous zone (column 7, lines 22-28) to minimize combustion of the particulates. Appellant's process involves an ascending temperature profile whereas Angello II's process utilizes a descending temperature profile.

For the reasons provided above, both Von Blucher et al. and Angello II teach away from Appellant's process as defined in independent claim 18 and dependent claims 19, 21, 25, and 27-35. Clearly, the very art cited teaches the advantages of separating the carbonization of polymer particles into separate processes related to functionalization and cross-linking followed by carbonization. In arriving at the combination of Von Blucher et al. and Angello II, the Examiner failed to consider the totality of the cited art which itself demonstrates the unobviousness of Appellant's claimed invention. Only through hindsight can aspects of Appellant's claimed process be related to aspects of the cited art. Because both Von Blucher et al. and Angello II teach away from combining the references as proposed by the Examiner, Appellant submits that it is improper to combine the references and, therefore, that a *prima facie* case of obviousness has not been established. Accordingly, Appellant submits that claim 18, and dependent claims 19, 21, 25, and 27-35 are in condition for allowance.

**B. Rejection of Claims 22-24 and 36-37 under 35 U.S.C. §103(a).**

Claims 22-24 and 36-37 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Von Blucher (US Patent Pub. No. 2003/0092560) in view of Angelo II (US 4,273,619) and further in view of Schwartz, Jr. (US 5,212,144).

**1. Claims 22-24 and 36-37 are patentable in view of 35 U.S.C. §103(c)**

Appellant respectfully submits that combination of references cited, primarily depending on the Von Blucher reference (US Patent Pub. No. 2003/0092560), fail to support a prima facie case of obviousness under 35 U.S.C. §103(a) because the present application (10/567,794) and the Von Blucher application (US Patent No. 2003/0092560, now US Patent No. 7,288,504) were at the time the invention of the present application was made, owned by Blucher GmbH and thus the Von Blucher reference is not properly prior art under the exception codified by 35 U.S.C. §103(c). Accordingly, Appellant submits that claims 22-24 and 36-37, are in condition for allowance.

**2. Independent Claim 36 is Patentable.**

Claim 36 corresponds to claim 18 having the additional feature of requiring “...the carbonization apparatus further comprising at least one lock between individual successive temperature zones or within individual temperature zones, so that there is at least essentially no mixing through of process gases from different temperature zones between which said at least one lock is disposed.”

As noted above, Appellant submits that the Von Blucher et al. and Angello II references cannot be combined because the Blucher et al. is not prior art under the exception codified by 35 U.S.C. §103(c). Moreover, even if the Von Blucher et al. reference were a proper prior art reference, the reference specifically teaches away from the combination. For the reasons discussed above [Section A(2)] with regard to claim 18, Appellant submits that Von Blucher et al. specifically teaches away from the proposed combination of Von Blucher et al. and Angello II and that the proposed combination can only be arrived at through hindsight and by ignoring the totality of the prior art teaching. As noted above, Von Blucher et al. clearly teach away from Appellant’s process. Angello II teaches a process involving a different starting material, utilizing a different temperature profile, utilizing different gaseous phases, releasing different gaseous products, and resulting in a different carbonaceous product. The process taught in Angello II is simply not related to the process from Appellant’s claim 36.

In an effort to construct a case of obviousness the Examiner ignored specific teachings within the cited references that contradicted his position. In so doing, the Examiner failed to

consider the totality of the cited art, the bulk of which demonstrates the unobviousness of Appellant's claimed invention. Only through hindsight can aspects of Appellant's claimed process be related to aspects of the cited art. As a result, a prima facie case of obviousness has not been established with regard to claim 36. Accordingly, Appellant submits that claim 36 is in condition for allowance.

**3. Independent Claim 37 is Patentable.**

Claim 37 corresponds to claim 18 having the additional feature of requiring the apparatus having "...at least one lock being present between the second temperature zone and the third temperature zone, so that acidic process gases from the second temperature zone are not mixed with the other process gases."

As noted above, Appellant submits that the Von Blucher et al. and Angello II references cannot be combined because the Blucher et al. is not prior art under the exception codified by 35 U.S.C. §103(c). Moreover, even if the Von Blucher et al. reference were a proper prior art reference, the reference specifically teaches away from the combination. For the reasons discussed above [Section A(2)] with regard to claim 18 and with regard to claim 36 [Section B(2)], Appellant submits that a prima facie case of obviousness has not been established with regard to claim 37. Accordingly, Appellant submits that claim 37 is in condition for allowance.

**C. Rejection of Claim 20 under 35 U.S.C. §103(a).**

Claim 20 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Von Blucher (US Patent Pub. No. 2003/0092560) in view of Angelo II (US 4,273,619) and further in view of Digre (US 5,437,237).

**1. Claim 20 is patentable in view of 35 U.S.C. §103(c)**

Appellant respectfully submits that combination of references cited, primarily depending on the Von Blucher reference (US Patent Pub. No. 2003/0092560), fail to support a prima facie case of obviousness under 35 U.S.C. §103(a) because the present application (10/567,794) and the Von Blucher application (US Patent No. 2003/0092560, now US Patent No. 7,288,504 were at the time the invention of the present application was made, owned by Blucher GmbH (35 U.S.C. §103(c)). Accordingly, Appellant submits that claim 20 is in condition for allowance.

**D. Rejection of Claim 26 under 35 U.S.C. §103(a).**

Claim 26 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Von Blucher (US Patent Pub. No. 2003/0092560) in view of Angelo II (US 4,273,619) and further in view of Giebelhausen et al. (US 6,316,378).

**1. Claim 26 is patentable in view of 35 U.S.C. §103(c)**

Appellant respectfully submits that combination of references cited, primarily depending on the Von Blucher reference (US Patent Pub. No. 2003/0092560), fail to support a prima facie case of obviousness under 35 U.S.C. §103(a) because the present application (10/567,794) and the Von Blucher application (US Patent No. 2003/0092560, now US Patent No. 7,288,504 were at the time the invention of the present application was made, owned by Blucher GmbH (35 U.S.C. §103(c)). Accordingly, Appellant submits that claim 26 is in condition for allowance.

**E. Summary**

Each of claims 18-37 were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Von Blucher (US Patent Pub. No. 2003/0092560), in view additional references. The Examiner cited the Von Blucher et al. reference as the primary reference for each rejection. Von Blucher et al., in combination with the additional cited references fails to support a prima facie case of obviousness under 35 U.S.C. §103(a) because the present application (10/567,794) and the Von Blucher application (US Patent No. 2003/0092560, now US Patent No. 7,288,504 were at the time the invention of the present application was made, owned by Blucher GmbH, and thus Von Blucher et al. is not properly prior art under the 35 U.S.C. §103(c) exception. Additionally, claims 18-37 are patentable in view of MPEP 2145 and the Cases cited therein for the reasons cited above.

In view of the remarks above, Appellant respectfully submits that the present invention is in condition for allowance and respectfully requests the Honorable Board of Appeals to reverse the Examiner's rejections and allow pending claims 18-37.

Respectfully submitted,

July 31, 2009

/Edward E. Sowers/  
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### **VIII. Claims Appendix**

#### List of Claims

18. A process for producing granular activated carbon by carbonization of suitable carbonaceous polymers in the form of polymer granules as a starting material, which polymer granules are convertible by carbonization into carbon, wherein the polymer granules are continuously moved through a carbonization apparatus comprising a plurality of temperature zones so that a complete conversion of the starting material to carbon is effected, wherein the carbonization apparatus comprises at least the following temperature zones in the following order:
- a) a first temperature zone ("sulfonating zone") where in the case that the starting material contains no groups which, when thermally decomposed, lead to free radicals and thus to cross-linkages or else in the case that such groups are to be additionally introduced into the starting material, these groups are introduced into the starting material; then
  - b) a second temperature zone ("pre-carbonization zone" or "zone of acidic gases"), the second temperature zone having a higher average temperature than the first temperature zone, wherein in the second temperature zone the groups which, when thermally decomposed, lead to free radicals and thus to cross-linkages are split off from the starting material, so that carbonization and thermal decomposition of the starting material ensues, accompanied by crosslinking of the polymers and formation of carbon; and then
  - c) a third temperature zone ("post-carbonization zone"), the third carbonization zone having a higher average temperature than the second temperature zone, wherein in the third temperature zone further carbonization of the starting material resulting from the second temperature zone is performed, so that a complete conversion of the starting material to carbon is effected;

wherein the individual temperature zones are separately and independently controlled.

19. The process according to claim 18, wherein the carbonization apparatus used is a continuous rotary tube or a continuous rotary tube oven.
20. The process according to claim 18, wherein the carbonization apparatus used is a belt-oven.
21. The process according to claim 18, wherein the polymer granules are continuously moved through the temperature zones of the carbonization apparatus by means of transporting or conveying means.
22. The process according to claim 18, wherein the individual temperature zones possess separate and independent exhaust means, so that the process gases from the different temperature zones are separated and separately collected.
23. The process according to claim 18, wherein the carbonization apparatus comprises at least one lock between individual successive temperature zones or within individual temperature zones, so that there is at least essentially no mixing through of process gases from different temperature zones between which at least one lock is disposed.
24. The process according to claim 23, wherein at least one lock is present between the second temperature zone and the third temperature zone, so that acidic process gases from the second temperature zone are not mixed with other process gases.
25. The process according to claim 18, wherein process control is performed by setting the temperature profile in the individual temperature zones.

26. The process according to claim 18, wherein process control is performed by setting the speed at which the starting material moves through the temperature zones of the carbonization apparatus.
27. The process according to claim 18, wherein the total residence time of the starting material in the carbonization apparatus is in the range from 0.1 to 5 hours.
28. The process according to claim 18, wherein the first temperature zone is operated at temperatures in the range of from 50 to 200 °C.
29. The process according to claim 18, wherein the second temperature zone is operated at temperatures in the range of from 100 to 500 °C
30. The process according to claim 18, wherein the third temperature zone is operated at temperatures in the range of from 400 to 1,200°C.
31. The process according to claim 18, wherein in the first temperature zone the groups which, when thermally decomposed, lead to free radicals and thus to cross-linkages are sulfonic acid groups and are introduced into the starting material by sulfonation.
32. The process according to claim 18, wherein the starting material used comprises polymers in the form of polymer granules based on styrene and divinylbenzene and containing chemical groups which, when thermally decomposed, lead to free radicals and thus to cross-linkages.
33. The process according to claim 32, wherein the chemical groups leading to cross-linkages are sulfonic acid groups being already present in the starting material and wherein the weight ratio of polymers to sulfonic acid groups is in the range from 5:1 to 1:1.

34. The process according to claim 32, wherein the starting material used comprises ion-exchanger resins having sulfonic acid groups or precursors of such ion-exchanger resins.
35. The process according to claim 18, wherein the carbonized material is subsequently subjected to an activation.
36. A process for producing granular activated carbon by carbonization of suitable carbonaceous polymers in the form of polymer granules as a starting material, which polymer granules are convertible by carbonization into carbon, wherein the polymer granules are continuously moved through a carbonization apparatus comprising a plurality of temperature zones so that a complete conversion of the starting material to carbon is effected, wherein the carbonization apparatus comprises at least the following temperature zones in the following order:
  - a) a first temperature zone ("sulfonating zone") where in the case that the starting material contains no groups which, when thermally decomposed, lead to free radicals and thus to cross-linkages or else in the case that such groups are to be additionally introduced into the starting material, these groups are introduced into the starting material; then
  - b) a second temperature zone ("pre-carbonization zone" or "zone of acidic gases"), the second temperature zone having a higher average temperature than the first temperature zone, wherein in the second temperature zone the groups which, when thermally decomposed, lead to free radicals and thus to cross-linkages are split off from the starting material, so that carbonization and thermal decomposition of the starting material ensues, accompanied by crosslinking of the polymers and formation of carbon; and then
  - c) a third temperature zone ("post-carbonization zone"), the third carbonization zone having a higher average temperature than the second temperature zone, wherein in the

third temperature zone further carbonization of the starting material resulting from the second temperature zone is performed, so that a complete conversion of the starting material to carbon is effected;

wherein the individual temperature zones are separately and independently controlled,

the carbonization apparatus further comprising at least one lock between individual successive temperature zones or within individual temperature zones, so that there is at least essentially no mixing through of process gases from different temperature zones between which said at least one lock is disposed.

37. A process for producing granular activated carbon by carbonization of suitable carbonaceous polymers in the form of polymer granules as a starting material, which polymer granules are convertible by carbonization into carbon, wherein the polymer granules are continuously moved through a carbonization apparatus comprising a plurality of temperature zones so that a complete conversion of the starting material to carbon is effected, wherein the carbonization apparatus comprises at least the following temperature zones in the following order:
- a) a first temperature zone ("sulfonating zone") where in the case that the starting material contains no groups which, when thermally decomposed, lead to free radicals and thus to cross-linkages or else in the case that such groups are to be additionally introduced into the starting material, these groups are introduced into the starting material; then
  - b) a second temperature zone ("pre-carbonization zone" or "zone of acidic gases"), the second temperature zone having a higher average temperature than the first temperature zone, wherein in the second temperature zone the groups which, when thermally decomposed, lead to free radicals and thus to cross-linkages are split off from the starting material, so that carbonization and thermal decomposition of the

starting material ensues, accompanied by crosslinking of the polymers and formation of carbon; and then

- c) a third temperature zone ("post-carbonization zone"), the third carbonization zone having a higher average temperature than the second temperature zone, wherein in the third temperature zone further carbonization of the starting material resulting from the second temperature zone is performed, so that a complete conversion of the starting material to carbon is effected;

wherein the individual temperature zones are separately and independently controlled,

with at least one lock being present between the second temperature zone and the third temperature zone, so that acidic process gases from the second temperature zone are not mixed with other process gases.

**IX. Evidence Appendix**

No evidence has been entered.

**X. Related Proceedings Appendix**

Appellant is unaware of any Related Proceedings.